

CLAIMS

What is claimed is:

1. A solid carbonylation catalyst useful for producing esters and carboxylic acids from reactants including lower alkyl alcohols, lower alkyl alcohol generating compositions, and mixtures thereof in a vapor phase carbonylation process, said catalyst comprising a solid component comprising a catalytically effective amount of platinum and tin associated with a solid catalyst support material and a catalytically effective amount of a vaporous component comprising a halogen promoter.

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10 2. The solid carbonylation catalyst according to Claim 1 wherein said solid support is carbon.

3. The solid carbonylation catalyst of claim 2 wherein said carbon support is activated carbon.

4. The solid carbonylation catalyst of claim 1 wherein said catalyst includes from about 0.1 weight percent to about 10 weight percent each of said platinum and tin.

15 5. The solid carbonylation catalyst of claim 1 wherein said catalyst includes from about 0.1 weight percent to about 2 weight percent each of said platinum and tin.

6. The carbonylation catalyst of claim 1 wherein said a halogen promoting component is selected from the group consisting of I_2 , Br_2 , and Cl_2 , hydrogen halides, gaseous hydriodic acid, alkyl and aryl halides having up to 12 carbon atoms, and mixtures thereof.

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25 7. The solid carbonylation catalyst of claim 6 wherein said halogen promoter is selected from the group consisting of hydrogen iodide, methyl iodide, ethyl iodide, 1-iodopropane, 2-iodobutane, 1-iodobutane, hydrogen bromide, methyl bromide, ethyl bromide, benzyl iodide and mixtures thereof.

8. The solid carbonylation catalyst of claim 1 wherein said platinum component is selected from the group consisting of platinum chloride, platinum oxide and mixtures thereof.

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5 9. The solid carbonylation catalyst of claim 8 wherein said platinum chloride is selected from the group consisting of chloroplatinic acid; dichlorodiammine platinum; dichlorobis(triphenylphosphine) platinum; dichloro(1,5-cyclooctadiene) platinum; dichlorobis(benzonitrile) platinum, dihydrogen hexachloroplatinate and mixtures thereof.

10 10. The solid carbonylation catalyst of claim 8 wherein said tin component is selected from the group consisting of tin (II) chloride, alkyl carboxylate salts wherein at least one of the carbon atoms is bound to tin and said alkyl group has from 1 to 10 carbon atoms, aryl carboxylate salts wherein at least one of the carbon atoms is bound to tin and said aryl group has from 6 to 24 carbon atoms, tin (II) oxalate and mixtures thereof.

15 11. A carbonylation catalyst useful for producing esters and carboxylic acids from reactants including lower alkyl alcohols, lower alkyl alcohol generating compositions, and mixtures thereof in a vapor phase carbonylation process, said catalyst comprising from about 0.1 weight percent to about 10 weight percent of platinum and from about 0.1 weight percent to about 10 weight percent of tin associated with an activated carbon support material and a catalytically effective amount a halogen promoting component selected from the group consisting of hydrogen iodide, methyl iodide, ethyl iodide, 1-iodopropane, 2-iodobutane, 1-iodobutane, hydrogen bromide, methyl bromide, ethyl bromide, benzyl iodide and mixtures thereof.

20 12. The solid carbonylation catalyst of claim 11 wherein said catalyst includes from about 0.1 weight percent to about 2 weight percent each of said platinum and tin.

25 13. The carbonylation catalyst of claim 11 wherein said platinum component is selected from the group consisting of chloroplatinic acid; dichlorodiammine platinum; dichlorobis(triphenylphosphine) platinum; dichloro(1,5-cyclooctadiene) platinum; dichlorobis(benzonitrile) platinum, dihydrogen hexachloroplatinate and mixtures thereof and said tin component is selected from the group consisting of tin (II) chloride, tin (II) oxalate and mixtures thereof.

30 14. The carbonylation catalyst of claim 11 wherein said reactant is methanol.

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15. A carbonylation catalyst useful for producing esters and carboxylic acids from reactants including lower alkyl alcohols, ether and ester derivatives of the alcohols, and ester-alcohol mixtures in a vapor phase carbonylation process, said catalyst comprising a solid component having from about 0.1 weight percent to about 2 weight percent of platinum and from about 0.1 weight percent to about 2 weight percent of tin associated with an activated carbon support material and a vaporous component comprising a catalytically effective amount of a halogen promoting component selected from the group consisting of hydrogen iodide, methyl iodide, ethyl iodide, 1-iodopropane, 2-iodobutane, 1-iodobutane, hydrogen bromide, methyl bromide, ethyl bromide, benzyl iodide and mixtures thereof.

16. The carbonylation catalyst of claim 15 wherein said platinum component is selected from the group consisting of chloroplatinic acid; dichlorodiammine platinum; dichlorobis(triphenylphosphine) platinum; dichloro(1,5-cyclooctadiene) platinum; dichlorobis(benzonitrile) platinum, dihydrogen hexachloroplatinate and mixtures thereof and said tin component is selected from the group consisting of tin (II) chloride, tin (II) oxalate and mixtures thereof.

17. A carbonylation catalyst system useful for producing methyl acetate and acetic acid from reactants including methanol, dimethyl ether and methyl acetate, and mixtures thereof in a vapor phase carbonylation process, said catalyst system comprising a solid supported catalyst having from about 0.1 weight percent to about 2 weight percent of platinum selected from the group consisting of chloroplatinic acid; dichlorodiammine platinum; dichlorobis(triphenylphosphine) platinum; dichloro(1,5-cyclooctadiene) platinum; dichlorobis(benzonitrile) platinum, dihydrogen hexachloroplatinate and mixtures thereof, and from about 0.1 weight percent to about 2 weight percent of tin selected from the group consisting of tin (II) chloride, tin (II) oxalate and mixtures thereof which are associated with an activated carbon support material and vaporous second component comprising at least one halide promoter selected from the group consisting of hydrogen iodide, methyl iodide, ethyl iodide, 1-iodopropane, 2-iodobutane, 1-iodobutane, hydrogen bromide, methyl bromide, ethyl bromide, benzyl iodide and mixtures thereof and wherein a

molar ratio of methanol or methanol equivalents to halide present is from about 1:1 to 10,000:1.